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Additional data to the herpetofauna of Afghanistan

Daniel Jablonski[1], John M. Regan[2], Chace Holzheuser[3], Javeed Farooqi[4], Abdul Basit[4,5], Rafaqat Masroor[6]

1 *Department of Zoology, Comenius University in Bratislava, Ilkovičova 6, Mlynská dolina, 842 15 Bratislava, Slovakia*
2 *216th STE, 16310 Graham, Washington, USA*
3 *Department of Biological Science, Florida State University, Tallahassee, Florida, USA*
4 *University of Chitral, Department of Zoology, Seen Lasht, Chitral, Pakistan*
5 *Tawakh, Anuba District, Panjshir, Afghanistan*
6 *Pakistan Museum of Natural History, Garden Avenue, Shakarparian 44000, Islamabad, Pakistan*

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Corresponding author: *Daniel Jablonski* (daniel.jablonski@balcanica.cz)

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Abstract

This study provides observation on 21 species of amphibians and reptiles obtained during various field trips in Afghanistan from 2007 to 2018. The core of this study is distributional data collected mostly by the second author of this paper that were systematically evaluated. Our records show a notable expansion of the current distribution range for several species and highlight the need for more extensive further sampling within the entire country. The first record of *Cyrtopodion agamuroides* (Nikolsky, 1900) complex for Afghanistan is presented here, increasing the number of herpetofauna in the country to 117 species.

Abstract in Pashto

دا تحقیقات د 21 نوع په ژوندی حیواناتو او خزندګانو په هکله په مختلف عملی سفرونو کی د 2007 نه تر 2018 پوری په افغانستان کی ترلاسه شوی دی. ددی تحقیقاتو عمدی برخی دوئم لیکوال په واسطه ارزیابی شوی وه چی دتشریح ور دی. زموژ فعلی یاداشتونه دحیواناتو انواع زیاتوالی دملاحظه ور دی او دتول هیواد په کچه نمونی اخیستلو ضرورت دی او انکشاف ورکرل شی. لومری مرکب *Cyrtopodion agamuroides* (Nikolsky, 1900) دلته نندارې ته وړاندی کیږی چی دخزندګانو تعداد 117 قسمونو ته لوړیگی

Abstract in Dari Persian

ين تحقيقات در ارتباط به 21 نوع حيوانات ذولحيات وخزنده كه درجريان سفرها مختلف علمي از سال 2007 الي 2018 در افغانستان بدست آمده ، را تحت مشاهده قرار ميدهد. بخش عمده اين تحقيقات توسط نويسنده دوهمي ارزيابي گريده بود كه قابل تشريح است. يادداشت هايي فعلي مان درارتبا ط به گسترش انواع مختلف حيوانات چشمگير بوده ومطالب كه جهت نمونه گيري در سراسر كشور نياز است ، توسع داده ميشود. اولين مركب *Cyrtopodion agamuroides* (Nikolsky, 1900) دراينجا به نمايش گذاشته ميشود كه تعداد از خزنده را به 117 نوع آن افرايش ميدهد

Key Words

amphibians, reptiles, first record, distribution, zoogeography, Central Asia

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Introduction

Afghanistan is one of the most biodiverse countries at the junction of Central and South Asia, with an extremely varied mountainous and desert topography resulting in numerous habitat types. This fact is also reflected in the composition of amphibians and reptiles, with 116 species (118 with subspecies) in 21 families known to date (Wagner et al. 2016). The herpetofauna of this country is comprised of Palearctic and Oriental elements, two main zoogeographic regions of Eurasia (Sindaco and Jeremčenko 2008; Wagner et al. 2016), which makes Afghanistan a crucial territory regarding research of historical biogeography. Simultaneously, it is one of the least known countries in terms of current biodiversity research due to forty years of continuous war and instability. There are decent foundational knowledge and publications on species diversity and distribution accumulated and published during a forty-year period called "Afghanistan's Golden Age" from about the 1930s to the mid-1970s (see Wagner et al. 2016 for a review). However, data obtained and published after this period are rare and mostly referred to old collections (e.g. Clark 1992; Kuch 2004; Wagner et al. 2016; Jablonski and Lesko 2018; Jablonski et al. 2019). Therefore, the country remains largely unexplored and poorly surveyed. Whereas original distribution data on Afghan herpetofauna obtained in the 21st century are virtually absent in published literature, to bridge the gaps, we here present additional distribution data recently collected in Afghanistan.

Material and methods

This study compiles records from several independent field observations (own or acquired from other sources) procured from 2007 to 2018 in different parts of the following provinces of Afghanistan: Badakhshan, Baghlan, Balkh, Helmand, Kabul, Kandahar, Paktia, Paktika, Uruzgan and Zabul. Distribution data were taken from 22 georeferenced points (Table 1). Most of the records and photographs came from irregular field trips conducted by the second author (JR) during his non-zoological photographic work in Afghanistan in the period 2008–2011. This author presented some of these records (mainly as photographs or comments in the text) in a small guide (Regan 2017; Fig. 1) with a very general format. Although data in this guide are very interesting and have value, they lack deeper zoological evaluation and contain a number of wrongly identified species. We revised all obtained and available data, corrected species taxonomy and summarised available information on locality, geographic position, date of observation, type of observed habitat and any other pertinent information. Furthermore, Regan´s guide contains additional species that were observed in Saudi Arabia, not Afghanistan and which could confuse further field data compilations for Afghanistan: *Trapelus ruderatus* (p. 21), *Phrynocephalus maculatus* (p. 22), and *Bunopus tuberculatus* (p. 28). Therefore, we excluded these species from the checklist presented below. Other dubious cases or

Table 1. Georeferenced localities presented as decimal degree recorded in Afghanistan with corresponding elevation and species.

Province	Locality	Coordinates	elevation (m)	Species
Badakhshan	Arga Queshlaq	37.2399N, 70.3561E	1189	*Bufotes viridis* complex
	Broghil Pass	36.8860N, 73.3540E	~3800	*Bufotes viridis* complex
	Jurm	36.8627N, 70.8341E	1555	*Hemorrhois ravergieri*
Baghlan	Pol-e-Khomri	35.9692N, 68.6914E	623	*Testudo horsfieldii*
Balkh	Camp Mike Spann Chapel, Mazar-i-Sharif	36.6503N, 66.9965E	409	*Trapelus agilis*, *Tenuidactylus caspius*, *Platyceps rhodorachis*
	Camp Marmal, Mazar-i-Sharif	36.7024N, 67.2358E	390	*Platyceps karelini*
	Dehdadi	36.6403N, 66.9382E	418	*Bufotes viridis* complex
	Kaldar	37.1474N, 67.7771E	305	*Eremias* aff. *nigrocellata*
	Mazar-i-Sharif	36.6890N, 67.1360E	370	*Bufotes viridis* complex
	Nahr Shahi	36.6565N, 66.9212E	402	*Bufotes viridis* complex
	Shor Tepah	37.3346N, 66.8518E	281	*Phrynocephalus mystaceus*
Helmand	Camp Leatherneck, Washir	31.8667N, 64.1954E	890	*Cyrtopodion scabrum*, *C. agamuroides* complex
	Lashkargāh	31.6136N, 64.4081E	788	*Trapelus agilis*, *Eremias persica*, *Mesalina watsonana*
	Lashkargāh	31.6095N, 64.4080E	770	*Cyrtopodion scabrum*
Kabul	Camp Dubs - Kabul	34.4550N, 69.1076E	1865	*Bufotes viridis* complex, *Cyrtopodion watsoni*, *Hemorrhois ravergieri*, *Platyceps rhodorachis*, *Psammophis schokari*, *Ptyas mucosa*, *Spalerosophis diadema*
	Darul Aman - Kabul	34.4549N, 69.1132E	1870	*Altiphylax levitoni*, *Cyrtopodion scabrum*
Kandahar	Kandahar, Air Base	31.5210N, 65.8560E	1011	*Bufotes viridis* complex, *Euphlyctis cyanophlyctis*, *Trapelus agilis*, *Trapelus* aff. *megalonyx*, *Cyrtopodion scabum*, *Eremias persica*, *Mesalina watsonana*, *Platyceps rhodorachis*, *Echis carinatus*
	Spin Boldak	30.9938N, 66.3619E	1193	*Spalerosophis diadema*
Paktia	Gardez, Gardez Base	33.5868N, 69.2731E	2374	*Trapelus* aff. *megalonyx*, *Eremias persica*
Paktika	Waza Kwah	31.9498N, 68.8266E	2077	*Testudo horsfieldii*, *Eremias persica*
Uruzgan	Tarin Kowt	32.6138N, 65.8666E	1338	*Trapelus agilis*
Zabul	Lagman Base, Qalat	32.1306N, 66.9277E	1596	*Testudo horsfieldii*, *Trapelus agilis*

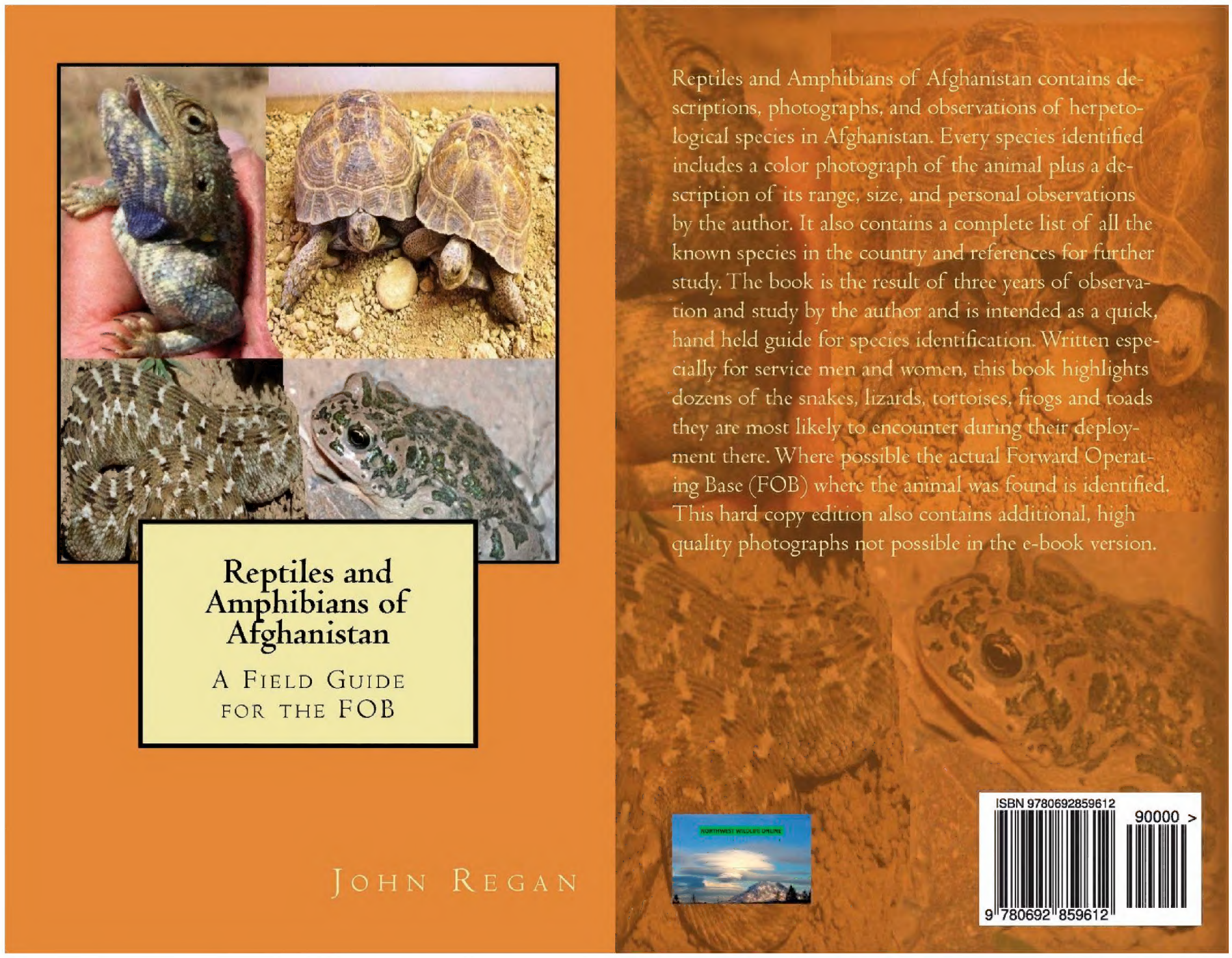
Reptiles and Amphibians of Afghanistan
A Field Guide for the FOB
John Regan
Reptiles and Amphibians of Afghanistan contains descriptions, photographs, and observations of herpetological species in Afghanistan. Every species identified includes a color photograph of the animal plus a description of its range, size, and personal observations by the author. It also contains a complete list of all the known species in the country and references for further study. The book is the result of three years of observation and study by the author and is intended as a quick, hand held guide for species identification. Written especially for service men and women, this book highlights dozens of the snakes, lizards, tortoises, frogs and toads they are most likely to encounter during their deployment there. Where possible the actual Forward Operating Base (FOB) where the animal was found is identified. This hard copy edition also contains additional, high quality photographs not possible in the e-book version.
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Figure 1. The field guide for Afghan amphibians and reptiles published by John Regan (2017) containing the data we critically evaluated in this study.

misidentifications are explained in the main text. All available data presented here were compared with the dataset of localities presented by Wagner et al. (2016) and we made updated maps for certain species using QGIS software (2019). All species or specimens photographs presented here were accessioned into the Herpetology collection of the Florida Museum of Natural History at the University of Florida (FLMNH UF 189172-232; Suppl. material 1).

Results and discussion

We present a checklist of amphibian and reptile species observed and/or photographed in Afghanistan that, in most cases, represent new locality or provincial records for the country. Two families of amphibians and six families of reptiles were recorded with 21 species presented overall in the checklist. An additional species, *Cyrtopodion agamuroides* (Nikolsky, 1900) complex, is here the first to be presented as another reptile for the species list of herpetofauna in Afghanistan.

AMPHIBIA
Anura
Bufonidae

Bufotes viridis (Laurenti, 1768) complex

Distribution in Afghanistan. According to Wagner et al. (2016), this species complex comprised four species (*B. oblongus*, *B. baturae*/*pseudoraddei*, *B. turanensis*, *B. zugmayeri*) that are recorded throughout Afghanistan, except the central Hindu Kush range (Fig. 2). We here followed comments presented in Jablonski et al. (2019), noting that comprehensive phylogeographic views on the genus are needed to resolve species distribution and phylogenetic composition in Afghanistan. This iconic toad complex is currently known from provinces Badakhshan, Badghis, Baglan, Balkh, Bamyan, Farah, Faryab, Ghazni, Helmand, Herat, Kabul, Kandahar, Kunduz, Logar, Nangarhar, Paktia, Samangan, Takhar, Wardak and Zabul (Wagner et al. 2016; Jablonski et al. 2019 and see therein for additional information). Wagner et al. (2016) did not assign (due to missing museum material) the record pre-

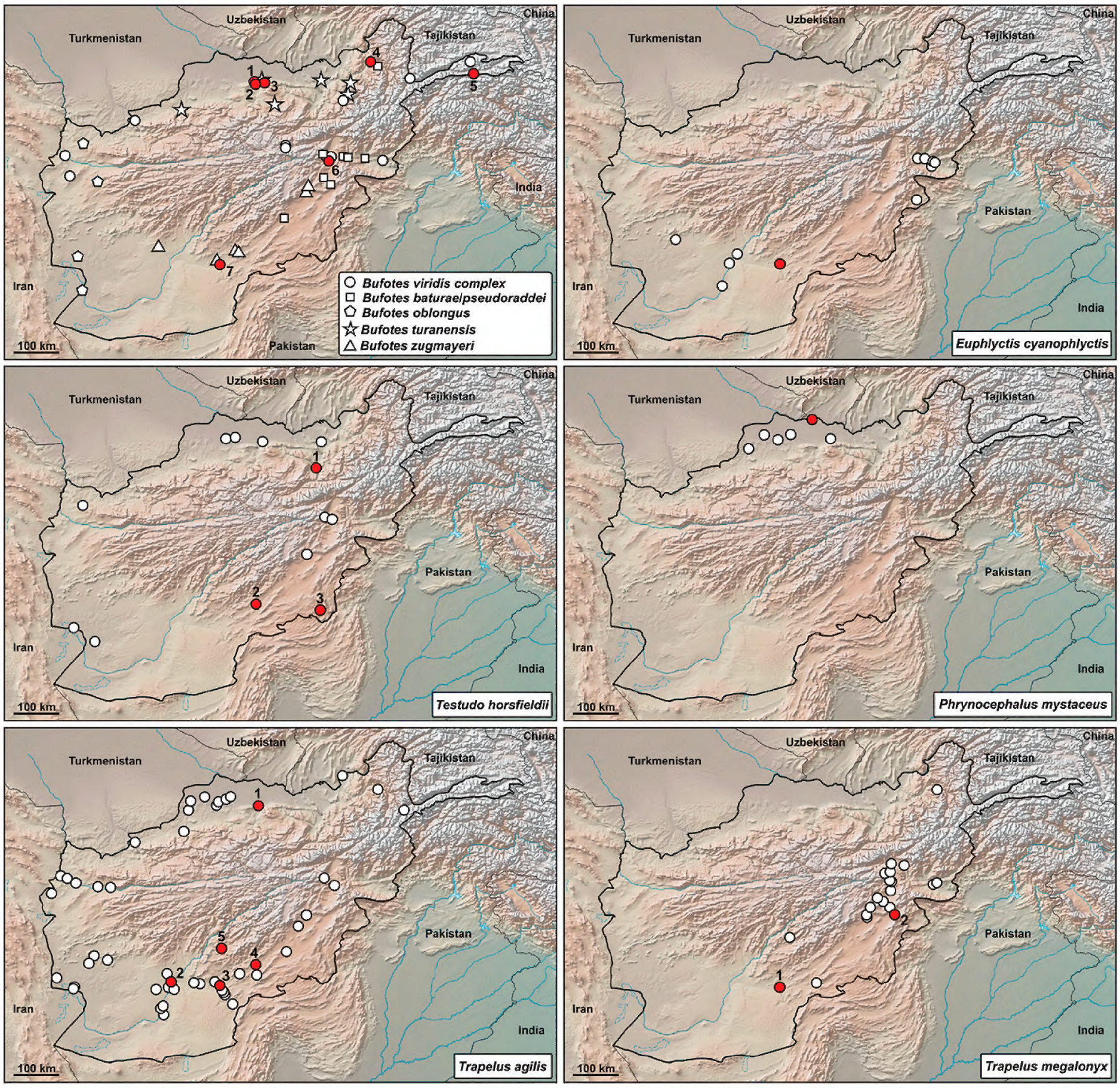

Figure 2. Updated herpetofaunistic records from Afghanistan (white dots: data of Buchroithner, 1981; Wagner et al. 2016; Jablonski et al. 2019; red dots: data of this study). *Bufotes viridis* complex (including species *B. oblongus*, *B. baturae/pseudoraddei*, *B. turanensis* and *B. zugmayeri* presented by Wagner et al. 2016): 1 – Dehdadi, Balkh; 2 – Nahr Shahi, Balkh; 3 – Mazar-i-Sharif, Balkh; 4 – Arga Queshlaq, Badakhshan; 5 – Broghil Pass, Badakhshan; 6 – Camp Dubs - Kabul, Kabul; 7 – Kandahar, Air Base, Kandahar. *Euphlyctis cyanophlyctis*: Kandahar, Air Base, Kandahar. *Testudo horsfieldii*: 1 – Pol-e-Khomri, Baghlan; 2 – Lagman Base, Qalat, Zabul; 3 – Waza Kwah, Paktika. *Phrynocephalus mystaceus*: Shor Tepah, Balkh. *Trapelus agilis*: 1– Camp Mike Spann Chapel, Mazar-i-Sharif, Balkh; 2 – Lashkargāh, Helmand; 3 – Kandahar, Air Base, Kandahar; 4 – Lagman Base, Qalat, Zabul; 5 – Tarin Kowt, Uruzgan. *Trapelus megalonyx*: 1 – Kandahar, Air Base, Kandahar; 2 – Gardez, Gardez Base, Paktia.

sented by Buchroithner (1981) that reported these toads from Tila Bay Valley (~37.28N, 73.33E, 4160 m a.s.l.), Wakhan, Badakhshan. This author mentioned an occurrence of *B. latastii* in Badakhshan, but this species is endemic to western Himalaya and is not known from the Hindu Kush range (Litvinchuk et al. 2018b).

Our records (Fig. 2). 1 – Dehdadi, Balkh (25 September 2011), one adult individual in semi-desert area; 2 – Nahr Shahi, Balkh (25 September 2011), one adult individual in village area; 3 – Mazar-i-Sharif, Balkh (11 September 2015), one adult female in house garden area (Fig. 3E); 4 – Arga Queshlaq, Badakhshan (22 July 2012), one adult female under the rock near an artificial canal (Fig. 3F); 5 – Broghil Pass, Wakhan, Badakhshan (4 September 2007); six adults in a hot water spring in rocky area; 6 – Camp Dubs - Kabul, Kabul (15 July 2011), several hundreds of tadpoles and juveniles in artificial ponds, dozens of adults in its vicinity (Fig. 3D); 7 – Kandahar,

Figure 3. Observed individuals of *Bufotes viridis* complex (Bufonidae) from Afghanistan: A, B, C – Different post-metamorphic stages of the species complex from Kandahar, Air Base, Kandahar; D – adult individual from Camp Dubs – Kabul, Kabul; E – adult female from Mazar-i-Sharif, Balkh (photo by Nasser Halaweh); F – adult female from Arga Queshlaq (photo by Glyn Morris).

Air Base, Kandahar (17 May 2009), several dozens of juveniles, subadult and adult individuals (Fig. 3A–C) in the vicinity of an artificial pond near the runway in semi-desert area (Fig. 10A).

Remarks. According to the map of Wagner et al. (2016), toads from Balkh Province should belong to *B. turanensis* (or *B. pewzowi*, *B. shaartusiensis*, see Ficetola and Stöck 2016; Litvinchuk et al. 2018a), from Badakhshan and Kabul Provinces to *B. baturae/pseudoraddei* and from Kandahar to *B. zugmayeri*. Although all our records represent new localities, they fall within regions or areas where these toads were previously known. Locality 5 represents an in-

teresting record near Broghil Pass at an elevation of about ~3800 m. Regan (2017) identified these toads incorrectly as "*Pseudepidalea viridis*" and "*Bufo surdus*" (pp. 51–55). The genus *Pseudepidalea* is a less used generic name for these toads, while *Bufotes surdus* (Boulenger, 1891) has never been recorded in Afghanistan.

Dicroglossidae

Euphlyctis cyanophlyctis (Schneider, 1799)

Distribution in Afghanistan. According to Wagner et al. (2016), this species is known from three isolated regions: first follows the valleys of Kabul and Kaitu Rivers in the east, second from Helmand River in the south and third from the area between the Khash and Farah Rud rivers in the south-west (provinces Farah, Helmand, Khost, Laghman, Nangarhar; Fig. 2).

Our records (Fig. 2). Kandahar, Air Base, Kandahar (17 May 2009), several dozen juveniles, subadult and adult individuals (Fig. 4A), grouped in large numbers in the artificial pond near the runway in semi-desert area (Fig. 10A).

Remarks. Distribution of this species in Afghanistan is restricted to the aforementioned river valleys or oasis and the surrounding vicinity and represents the species' northern distribution. Our record is the first for Kandahar Province and represents a new locality of the species.

REPTILIA
Testudines
Testudinidae

Testudo horsfieldii Gray, 1844

Distribution in Afghanistan. This tortoise is probably distributed throughout Afghanistan except the central massif of Hindu Kush and its valleys (Wagner et al. 2016 and see remarks therein for additional localities with an unclear position; Fig. 2). It is currently known from provinces of Balkh, Farah, Ghazni, Herat, Jowzjan, Kabul, Kunduz and Nimroz.

Our records (Fig. 2). 1 – Pol-e-Khomri, Baghlan (27 October 2011), one adult individual (Fig. 4B) recorded in the city; 2 – Lagman Base, Qalat, Zabul (14 March 2008), two adult individuals in semi-desert area of the Base; 3 – Waza Kwah, Paktika (6 December 2008), five adult individuals in arid habitat near a small village (Fig. 10D).

Remarks. All our records represent new localities and first species observations for the respective provinces. Localities 2 and 3 represent an important range extension in the country, connecting known species distributions in Afghanistan and Pakistan (Khan 2006). Wagner et al. (2016) recognises *T. h. horsfieldii* in Afghanistan. However, Fritz et al. (2009) mentioned the possible occurrence of another mitochondrial clade that could represent a different subspecies. We have noticed cases in Kabul and Kandahar where tortoises were stored by local traders for the Chinese food market. Therefore, conservation programmes should be prepared for this endangered tortoise.

Squamata
Agamidae

Phrynocephalus mystaceus (Pallas, 1776)

Distribution in Afghanistan. This species is currently known from only three provinces (Balkh, Faryab, Jowzjan) in northern Afghanistan (Wagner et al. 2016). Clark (1990) mentioned this species as common.

Our records (Fig. 2). Shor Tepah, Balkh (8 September 2011), one adult individual (Fig. 4C) in sand dunes area near the Amu Darya River.

Remarks. Our record is the northernmost for the species in Afghanistan, only 2000 m from the border with Uzbekistan.

Trapelus agilis (Olivier, 1804)

Distribution in Afghanistan. Distribution of this species in the country is well known compared to other herpetofauna. It is known from provinces Badakhshan, Badgis, Farah, Faryab, Ghazni, Helmand, Herat, Jowzjan, Kabul, Kandahar, Takhar and Zabul (Wagner et al. 2016). The following localities, presented by Wagner et al. (2016; p. 479–480), are not georeferenced in their study and are missing in the presented map: "*Dahlah (MZLU L958/3239)*", "*Faisabad, Kobt af indjodle (ZMUC R-36149)*", "*nr Tarnak River, 75 km NE of Kandahar (CAS 90777)*", "*nr Tarnak River, 90 km NE of Kandahar (CAS 90765-66)*", "*Uden Merke (ZMUC R-36156)*". The geographically different but unclear localities "*Seistan [Faizabad Prov.]*" and "*Seistan [Baqrabad Prov.]*", for which Wagner et al. (2016) used the same coordinates located in western Afghanistan, are omitted here.

Our records (Fig. 2). 1 – Camp Mike Spann Chapel, Mazar-i-Sharif, Balkh (1 October 2010), one adult individual observed in the bushy habitat in the camp; 2 – Lashkargāh, Helmand (3 September 2009), several adult and juvenile individuals (Fig. 4D) observed in the semi-arid habitat; 3 – Kandahar, Air Base, Kandahar (6 March 2009), several adult and subadult individuals (Fig. 4F, G) observed in the desert habitat with bushes near runway; 4 – Lagman Base, Qalat, Zabul (18 May 2009); ten individuals (Fig. 4E) observed in the semi-desert habitat; 5 – Tarin Kowt, Uruzgan (16 October 2008), several adult, subadult and juvenile individuals observed in the rocky habitat.

Remarks. All records presented here represent new locality data for the species in Afghanistan. Localities 1 and 5 represent new provincial records (Fig. 2). Regan (2017) presents this species on pp. 16–20. The individual from page 18 is presented here as *Trapelus* aff. *megalonyx* (see below).

Figure 4. Observed species of Dicroglossidae, Testudinidae and Agamidae families from Afghanistan: A – adult individuals of *Euphlyctis cyanophlyctis* from Kandahar, Air Base, Kandahar; B – adult individual of *Testudo horsfieldii* from Pol-e-Khomri, Baghlan; C – adult individual of *Phrynocephalus mystaceus* from Shor Tepah, Balkh; D – juvenile individual of *Trapelus agilis* from Lashkargāh, Helmand; E – adult male of *T. agilis* from Lagman Base, Qalat, Zabul; F, G – adult and subadult males of *T. agilis* from Kandahar, Air Base, Kandahar; H – adult male of *T.* aff. *megalonyx* from Gardez Base, Gardez, Paktia; I – adult individual of *T.* aff. *megalonyx* from Kandahar, Air Base, Kandahar.

Trapelus megalonyx Günther, 1864

Distribution in Afghanistan. This species is known mainly from south-eastern parts of the country (provinces Baghlan, Ghazni, Kabul, Kandahar, Kapisa, Logar, Nangarhar, Uruzgan and Wardak; Wagner et al. 2016; Jablonski et al. 2019). One record is presented from Fayzabad (Badakhshan) that is not marked in the Wagner et al. (2016) map (Plate 5, p. 541).

Our records (Fig. 2). 1 – Kandahar, Air Base, Kandahar (17 May 2009), one adult individual (Fig. 4I) in the desert habitat with bushes near the runway; 2 – Gardez, Gardez Base, Paktia (2 May 2008), one adult individual (Fig. 4H) observed in the semi-desert, rocky habitat.

Remarks. Both our records are new locality data. The record from Kandahar is currently the most western point of the species in the country and the record from Paktia is the first for the province. Although our records clearly correspond with the distribution range of the species in the country and individuals are very similar to *T. megalonyx*, photos do not allow better examination for clear species determination. Regan (2017) presents both records as *T. agilis* (pp. 15, 18). However, the individual from Gardez showed unusual colour patterns with an atypical violet dot on the lateral part of the body (Fig. 4H). Therefore, we present our records as "affiliated" to *T. megalonyx*.

Gekkonidae

Altiphylax levitoni (Golubev & Szczerbak, 1979)

Distribution in Afghanistan. Known only from three provinces in the central-eastern part of the country (Ghazni, Kabul, Logar; Wagner et al. 2016)

Our records. Darul Aman – Kabul, Kabul (20 May 2011), one adult and one subadult individual (Fig. 6A) were observed in the rocky area of the Darul Aman palace ruins.

Remarks. This species is known from Kabul city and its vicinity. Our record clearly falls in close proximity of known localities for the species. Therefore, we did not map this record. This species is mentioned as "*Unidentified Gecko*" in Regan (2017; p. 29).

Cyrtopodion agamuroides (Nikolsky, 1900) complex

Distribution in Afghanistan. This species has never been recorded in the country (Wagner et al. 2016). Although Šmíd et al. (2014) mentioned its presence, they do not provide any reference or voucher specimen. On the other hand, this species is known from border areas of Iran and Pakistan (Khan 2006; Šmíd et al. 2014; Fig. 5) and its occurrence in Afghanistan was highly expected (Wagner et al. 2016).

Our records (Fig. 5). Camp Leatherneck, Washir, Helmand (16 June 2009), one subadult individual (Figs 6C and D) found in desert habitat under waste (Fig. 10E).

Remarks. This is the first record of the species in Afghanistan, located approximately 250 airline km from the nearest locality in Iran (cf. Šmíd et al. 2014). Given morphological variability and ecological similarity with other members of *Cyrtopodion* (see Anderson 1999), this species probably forms a species complex that needs further examination.

Cyrtopodion scabrum (von Heyden, 1827)

Distribution in Afghanistan. This species is currently reported from seven provinces mainly in eastern and southern Afghanistan (Farah, Helmand, Kabul, Kandahar, Khost, Nangarhar, Zabul; Wagner et al. 2016). However, a record from Nangarhar (locality Jalalabad) is not mapped by Wagner et al. (2016), although they present its distribution in the text (see p. 487 vs. Plate 6, p. 542). One dubious record from the north-western part of the country was presented by Sindaco and Jeremčenko (2008).

Our records (Fig. 5): 1 – Darul Aman - Kabul, Kabul (15 July 2011), several adult individuals (Fig. 6F) from the rocky area of the Darul Aman palace ruins; 2 – Camp Leatherneck, Washir, Helmand (2 August 2010), one adult individual (Fig. 6H) from a building of the camp; 3 – Lashkargāh, Helmand (10 February 2009), dozens of adult individuals (Fig. 6G) from an old building in the middle of downtown; 4 – Kandahar, Air Base, Kandahar (19 May 2009), one juvenile individual (Fig. 6B) from the rocky area near buildings.

Remarks. Locality 1 in this study represents the first record for Kabul Province. Although other records represent new distribution data, they clearly fall into the known range of the species. This species is listed correctly by Regan (2017) on p. 24 but incorrectly on p. 26 (bottom photo; Lashkargāh, Helmand) as "*Tenuidactylus caspius*" that occurs in northern Afghanistan, but not in Helmand Province.

Cyrtopodion watsoni (Murray, 1892)

Distribution in Afghanistan. This species is known from two provinces; Nangarhar and Khost (Wagner et al. 2016; Fig. 5).

Our records (Fig. 5). Camp Dubs - Kabul, Kabul (20 May 2011), one adult and subadult (Fig. 6E) individual on the buildings of the camp.

Remarks. This is the first record for Kabul Province and complements the species distribution in the north-eastern part of the country. This species is mentioned in Regan (2017) on p. 25.

Tenuidactylus caspius (Eichwald, 1831)

Distribution in Afghanistan. This species is known from northern parts of the country (provinces Badakhshan,

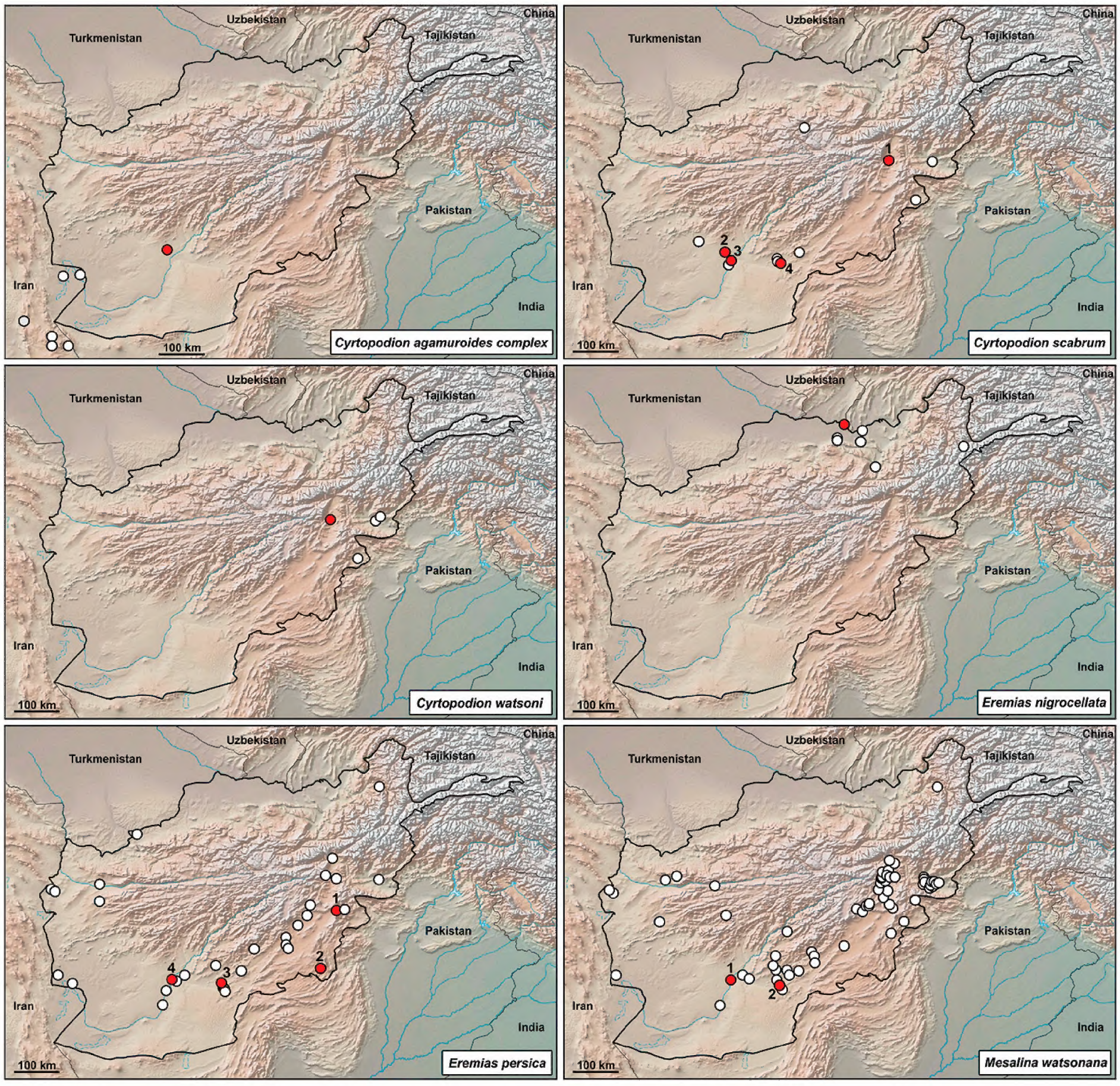

Figure 5. Updated herpetofaunistic records from Afghanistan (white dots: Wagner et al. 2016 and Jablonski et al. 2019; red dots: data of this study). *Cyrtopodion agamuroides* complex: Camp Leatherneck, Washir, Helmand (first country record; cf. Šmíd et al. 2014). *Cyrtopodion scabrum*: 1 – Darul Aman - Kabul, Kabul; 2 - Camp Leatherneck, Washir, Helmand; 3 - Lashkargāh, Helmand; 4 - Kandahar, Air Base, Kandahar. *Cyrtopodion watsoni*: Camp Dubs - Kabul, Kabul. *Eremias nigrocellata*: Kaldar, Balkh. *Eremias persica*: 1 – Gardez Base, Gardez, Paktia; 2 – Waza Kwah, Paktika; 3 – Kandahar, Air Base, Kandahar; 4 – Lashkargāh, Helmand. *Mesalina watsonana*: 1 – Lashkargāh, Helmand; 2 – Kandahar, Air Base, Kandahar.

Baghlan, Balkh, Herat, Jowzjan) and north-eastern (Kabul Prov.; Wagner et al. 2016).

Our records. Camp Mike Spann Chapel, Mazar-i-Sharif, Balkh (3 September 2010), one adult individual observed in a building of the camp (Fig. 6I).

Remarks. This species is already known from Mazar-i-Sharif and Balkh Province. Therefore, we did not map this record. The observation and species status is correctly described in Regan (2017) on p. 26 (upper photo).

Lacertidae

Eremias nigrocellata Nikolsky, 1896

Distribution in Afghanistan. Known only from northern Afghanistan (provinces Badakhshan, Baghlan, Balkh, Kunduz, Takhar; Wagner et al. 2016).

Our records (Fig. 5). Kaldar, Balkh (8 October 2011), one adult individual (Fig. 7A) approx. 10 m from a new-

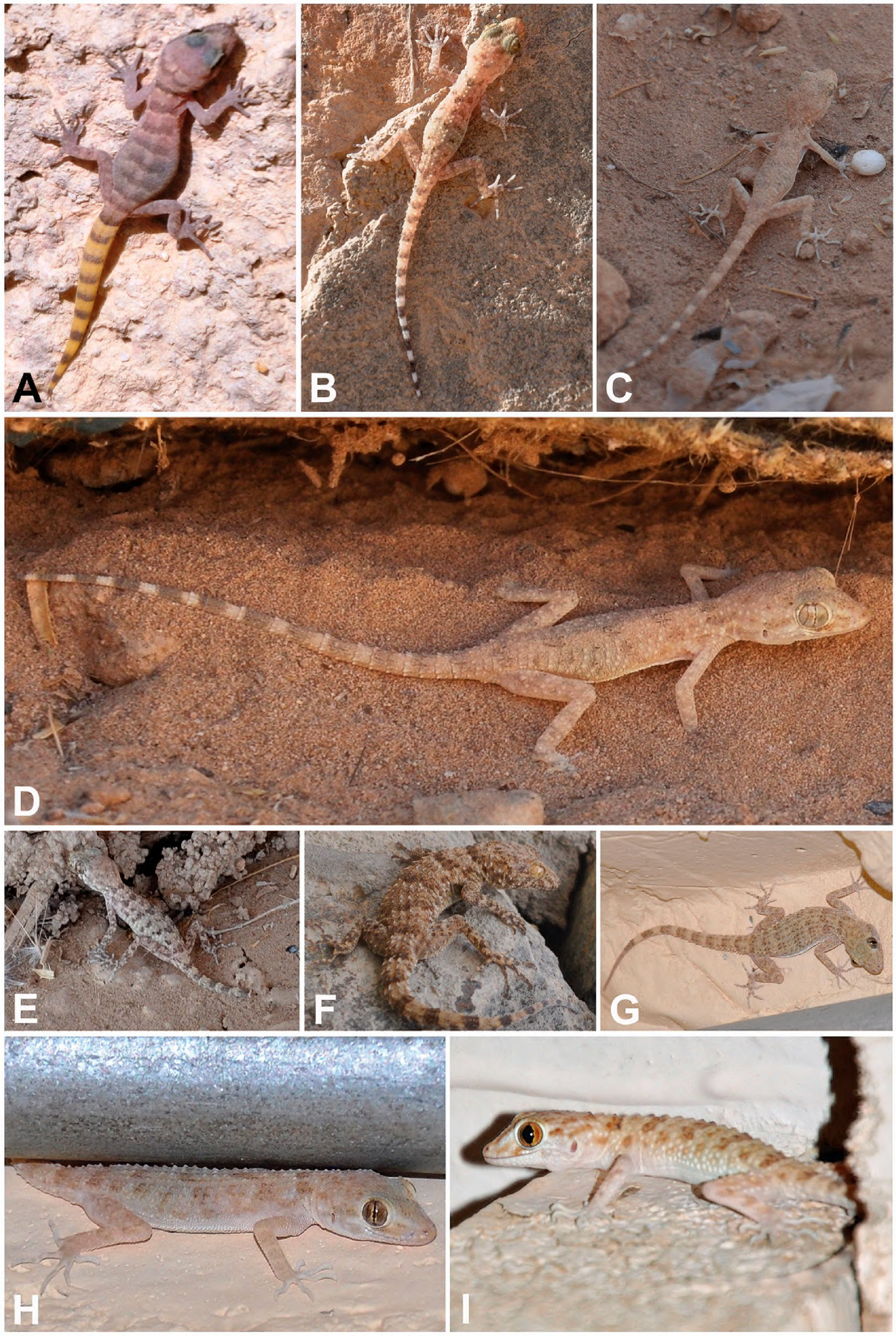

Figure 6. Observed species of the Gekkonidae family from Afghanistan: A – subadult individual of *Altiphylax levitoni* from Darul Aman - Kabul, Kabul; B – juvenile individual of *Cyrtopodion scabrum* from Kandahar, Air Base, Kandahar; C, D – subadult individual of *C. agamuroides* complex from Camp Leatherneck, Washir, Helmand; E – adult individual of *C. watsoni* from Camp Dubs - Kabul, Kabul; F – adult individual of *C. scabrum* from Darul Aman - Kabul, Kabul; G – adult individual of *C. scabrum* from Lashkargāh, Helmand; H – adult individual of *C. scabrum* from Camp Leatherneck, Washir, Helmand; I – adult individual of *Tenuidactylus caspius* from Camp Mike Spann Chapel, Mazar-i-Sharif, Balkh.

ly dug canal in the stony, semi-desert habitat near the Amu-Darya River (Fig. 10B).

Remarks. The species is mentioned by Wagner et al. (2016) from the locality "*Amu-Darya swamps, nr. Darquad, N of Djangi Quala, [Takhar Prov., 400 m] (ZMK 2562)*" but coordinates presented for this locality are the same as for "*Amu-Darya, N of Kunduz*" (see therein Appendix 1, p. 551). Therefore, the distribution point from Takhar Prov. is not mapped and presented in Fig. 5 of this study. Our record is currently the northernmost locality of the species in Afghanistan, only ca. 1500 m from the border with Tajikistan and 4000 m from the border with Uzbekistan. Although our record clearly corresponds with the distribution range of the species in the country and colouration and pattern of the species corresponds with *E. nigrocellata*, we present this record as "affiliated".

Eremias persica Blanford, 1875

Distribution in Afghanistan. This species is known from north-eastern, southern and western Afghanistan (provinces Badakhshan, Badghis, Farah, Ghazni, Helmand, Herat, Kabul, Kandahar, Khost, Nangarhar, Parwan, Wardak, Zabul; Wagner et al. 2016).

Our records (Fig. 5). 1 – Gardez Base, Gardez, Paktia (2 May 2008), several adult individuals observed in semi-desert habitat; 2 – Waza Kwah, Paktika (6 December 2008), one adult individual in the arid habitat; 3 – Kandahar, Air Base, Kandahar (24 July 2009), adult, subadult and juvenile individuals (Fig. 7B–D) in the semi-desert habitat with bushes and burrows (Fig. 10F) near the runway; 4 – Lashkargāh, Helmand (3 September 2009), common species represented by adult and juvenile individuals in the semi-desert habitat.

Remarks. All our records represent new distribution data for the species in Afghanistan. Localities 1 and 2 are new provincial records. Observations from Kandahar are incorrectly described in Regan (2017; see pp. 32, 33) as *E. fasciata* (juvenile presented here in Fig. 7C) and *Acathodactylus micropholis* (adults and juvenile in Fig. 7B, D).

Mesalina watsonana (Stoliczka, 1872)

Distribution in Afghanistan. A common species with several records mainly from south of the Hindu Kush range. It is currently known from the following provinces: Badakhshan, Farah, Ghazni, Ghor, Helmand, Herat, Kabul, Kandahar, Khost, Logar, Nangarhar, Paktia, Paktika, Parwan, Uruzgan, Wardak and Zabul (Wagner et al. 2016; Jablonski et al. 2019; Fig. 5). Two localities mentioned by Wagner et al. (2016): "*40 km NE of Kandhar, on Tarnak River (CAS 90757-60*" and "*Mil-Karez, Pol-Mil (MZLU L958/3230)*" (p. 498) are not presented with coordinates. Therefore, they are absent from the map.

Our records (Fig. 5). 1 – Lashkargāh, Helmand (3 September 2009), dozens of adult individuals in the semi-desert habitat; 2 – Kandahar, Air Base, Kandahar (22 October 2010), dozens of adult individuals (Fig. 7E, F) in the semi-desert with bushes near the runway.

Remarks. Both records presented here are new locality data with original coordinates. However, they clearly correspond with the known species range in Afghanistan. Regan (2017) listed this species as "*Mesalina guttulata*" (pp. 30–31). This name was superseded by *M. watsonana* after being upgraded to full species status from a subspecies of *M. guttulata*.

Colubridae

Hemorrhois ravergieri (Ménétriés, 1832)

Distribution in Afghanistan. This species has a scattered distribution with most of the records from the north-eastern part of the country. It is currently known from the provinces Badakhshan, Herat, Kabul, Kandahar, Kunduz, Nuristan, Paktia (Wagner et al. 2016).

Our records (Fig. 8). 1 – Jurm, Badakhshan (5 October 2011), one adult individual (Fig. 9A) observed in the early afternoon, sunning itself on the wall of a mini-hydro power intake canal near the town. It appeared to be approx. 1.2 metres long; 2 – Camp Dubs – Kabul, Kabul (17 July 2011), one adult individual observed in rocky habitat in the vicinity of the camp.

Remarks. Both our records represent new locality data although this species is known to occur in these provinces. The record from Camp Dubs - Kabul is erroneously assigned to *Daboia russelli* (Shaw & Nodder, 1797) by Regan (2017; see p. 38), but that species of viper has never been recorded or mentioned in available literature as a member of fauna in Afghanistan.

Platyceps karelini (Brandt, 1838)

Distribution in Afghanistan. This species has mostly north-western distribution in the country and is currently known from the provinces Badghis, Balkh, Farah, Herat, Jowzjan, Kandahar (Wagner et al. 2016 and see therein for other unmapped records on p. 510).

Our records. Camp Marmal, Mazar-i-Sharif, Balkh (10 October 2018), one subadult individual was found dead on the street of the camp.

Remarks. This record confirmed the species' previously known records from Mazar-i-Sharif and Balkh Province. Therefore, we did not map this record.

Platyceps rhodorachis (Jan in de Filippi, 1865)

Distribution in Afghanistan. This snake has a scattered distribution in the country, mostly around the Hindu Kush range. It is presented from the provinces Balkh, Ghazni, Helmand, Herat, Jowzjan, Kabul, Kandahar, Kunduz, Nangar-

Figure 7. Observed species of the Lacertidae family from Afghanistan: A – adult individual of *Eremias* aff. *nigrocellata* from Kaldar, Balkh; B – adult male and female of *E. persica* displaying mating behaviour and juveniles (C, D) from Kandahar, Air Base, Kandahar; E, F – adult male and female of *Mesalina watsonana* from Kandahar, Air Base, Kandahar.

har, Nuristan, Wardak and Zabul (Wagner et al. 2016). Since records "*10 km west of Jawand ["Kala-iChambar"] (SMF 67907)*" and "east of Kandahar (CAS 115970)" are not georeferenced in Wagner et al. (2016; p. 511), we did not include them in the list of georeferenced datasets for this species.

Our records. 1 – Camp Mike Spann Chapel, Mazar-i-Sharif, Balkh (29 May 2009 & 8 October 2010), two subadult individuals (Fig. 9C) in the area of the camp; 2 – Camp Dubs - Kabul, Kabul (17 July 2011), one subadult individual observed in the rocky habitat in the area of the camp; 3 – Kandahar, Air Base, Kandahar (28 April 2009), two subadult individuals (Fig. 9B) observed in the desert habitat with bushes near the runway.

Remarks. All our data correspond with previous records of the species from close localities and particular provinces. Therefore, we did not map these records. This species is described correctly in Regan (2017) on p. 40 but incorrectly on p. 46 (both photos; Camp Dubs - Kabul, Kabul) as "*Hemorrhios ravergieri*" (this version uses the wrong genus name).

Ptyas mucosa (Linnaeus, 1758)

Distribution in Afghanistan. This species is known from several scattered records across the country (provinces Badghis, Faryab, Herat, Kabul, Kandahar, Logar, Nuristan,

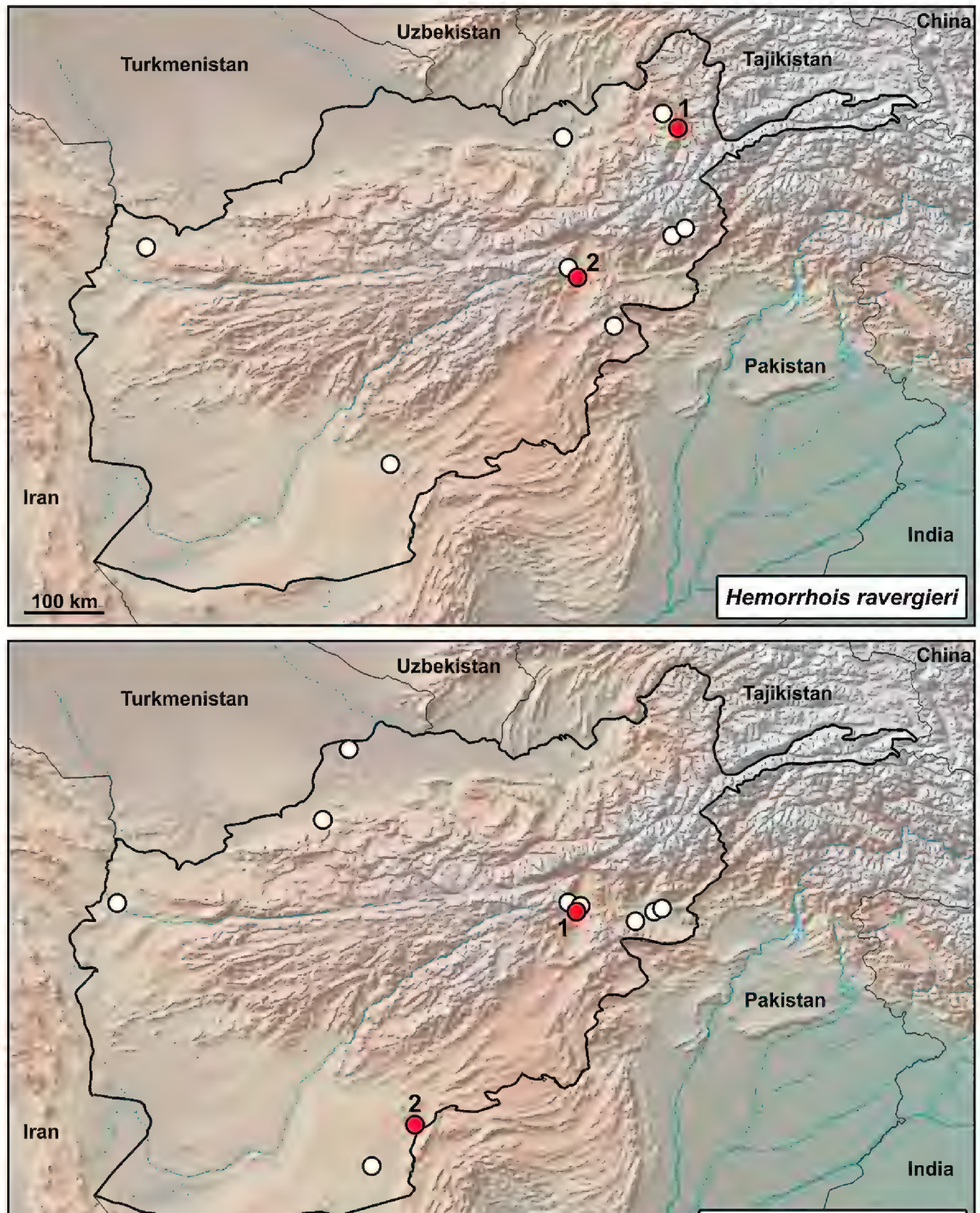

Figure 8. Updated herpetofaunistic records from Afghanistan (white dots: Wagner et al. 2016; red dots: data of this study). *Hemorrhois ravergieri*: 1 – Jurm, Badakhshan; 2 – Camp Dubs - Kabul, Kabul. *Spalerosophis diadema*: 1 – Camp Dubs - Kabul, Kabul; 2 – Spin Boldak, Kandahar. *Psammophis schokari*: Camp Dubs - Kabul, Kabul.

Figure 9. Observed species of Colubridae and Viperidae families from Afghanistan: A – adult individual of *Hemorrhois ravergieri* from Jurm, Badakhshan (photo by Glyn Morris); B – subadult individual of *Platyceps rhodorachis* from Kandahar, Air Base, Kandahar; C – subadult individual of *P. rhodorachis* (striped phenotype) from Camp Mike Spann Chapel, Mazar-i-Sharif, Balkh; D – adult individual of *Ptyas mucosa* from Camp Dubs - Kabul, Kabul; E – subadult individual of *Spalerosophis diadema* from Camp Dubs - Kabul, Kabul; F – subadult individual of *S. diadema* from Spin Boldak, Kandahar (photo by Ron Savage); G, H – subadult and adult individual of *Echis carinatus* from Kandahar, Air Base, Kandahar.

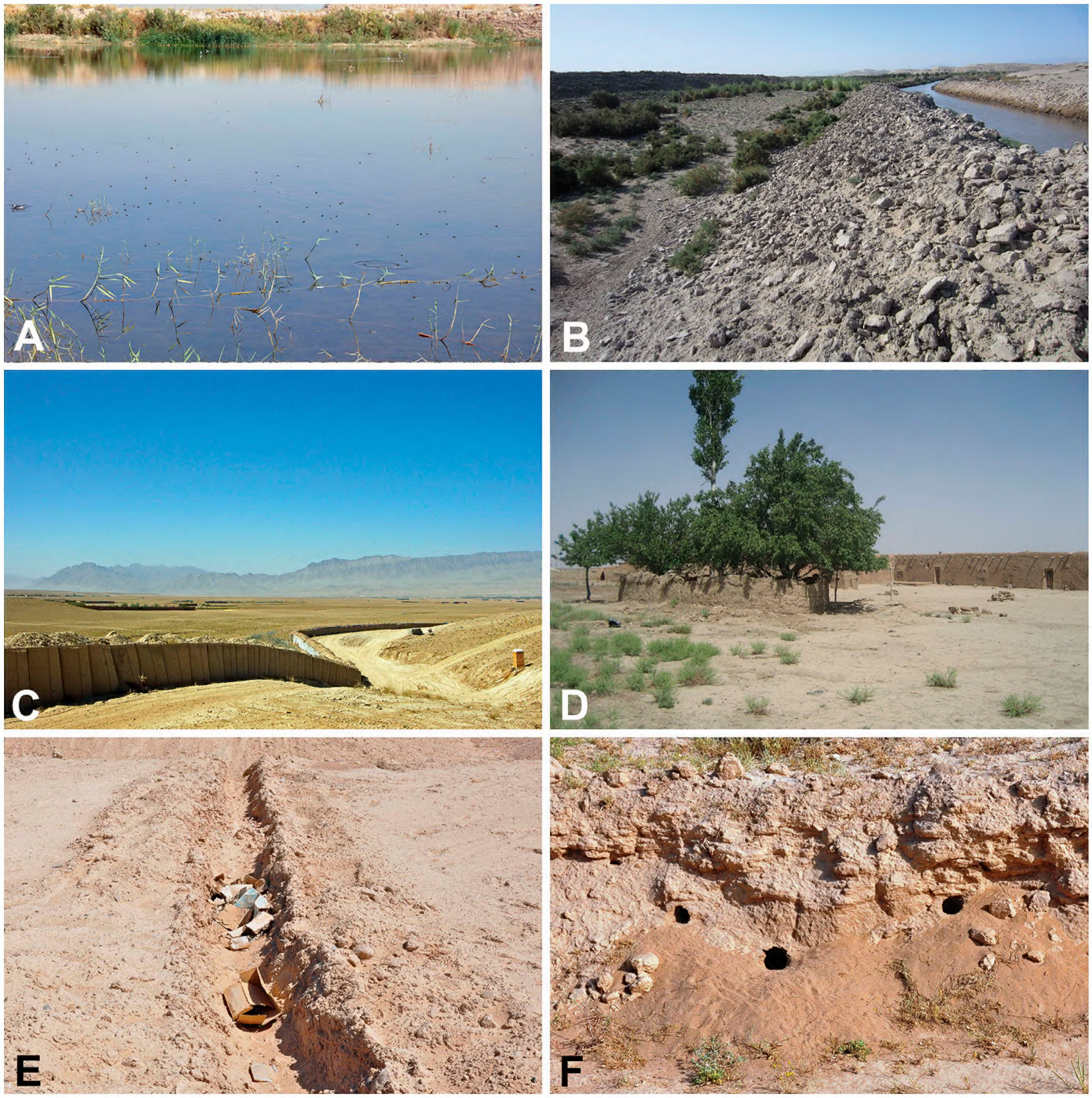

Figure 10. View on selected localities from Afghanistan that were visited: A – habitat of *Bufotes viridis* complex and *Euphlyctis cyanophlyctis* from Kandahar, Air Base, Kandahar; B – stony, semi-desert habitat of *Eremias* aff. *nigrocellata* from Kaldar, Balkh; C – semi-desert habitat of *Trapelus agilis* from Tarin Kowt, Uruzgan; D – vicinity of small village Waza Kwah, Paktika as habitat of *Testudo horsfieldii*; E – desert habitat of *Cyrtopodion agamuroides* complex from Camp Leatherneck, Washir, Helmand; F – burrows in semi-desert habitat that were used by *Eremias persica* as a shelter, Kandahar, Air Base, Kandahar.

Wardak; Wagner et al. 2016). Wagner et al. (2016) mentioned a record from locality "*Kamu (13325-26)*" (p. 511) but did not present georeferenced data. The coordinates should be 35.4002N, 71.4239E, Nuristan Prov.

Our records. Camp Dubs - Kabul, Kabul (13 October 2010), one adult individual (Fig. 9D) found 50 m outside the barrier of the camp in the bushy habitat.

Remarks. Wagner et al. (2016) presented the species occurrence in Kabul and its vicinity. Therefore, we did not map this record. The observation is correctly mentioned in Regan (2017) on pp. 42–43.

Spalerosophis diadema (Schlegel, 1837)

Distribution in Afghanistan. The distribution pattern of this species is divided into two main parts with desert or semi-desert habitats: the northern (provinces Herat, Faryab) and south-eastern (Kabul, Kandahar, Nangarhar). For details and other general locality data, see Wagner et al. (2016; p. 512).

Our records (Fig. 8). 1 – Camp Dubs - Kabul, Kabul (25 June 2011), one adult individual (Fig. 9E) found a 20-minute walk from the camp in rocky habitat; 2 – Spin

Boldak, Kandahar (20 November 2010), one subadult individual (Fig. 9F) found in the desert area of the camp.

Remarks. Our records correspond with the known or possible range of the species. Record 2 from Kandahar Province is the first exact record of the species from the southern part of the country and this province. The record from "*Nushki to Helmand*" has imprecise locality data (Wagner et al. 2016) and is most likely located in the southern part of Kandahar province. The record from Camp Dubs - Kabul was erroneously assigned to *Lytorhynchus ridgewayi* Boulenger, 1887 by Regan (2017; see p. 47). This species of *Lytorhynchus* is known in Afghanistan from only two localities of the western and south-western part of the country (provinces Herat, Kandahar).

Psammophis schokari (Forskål, 1775)

Distribution in Afghanistan. This snake has a scattered distribution in Afghanistan and situated mainly in the southern and south-eastern regions (Farah, Helmand, Kandahar, Laghman, Nimroz, Wardak; Wagner et al. 2016).

Our records (Fig. 8). Camp Dubs - Kabul, Kabul (3 May 2011), one adult individual observed in the bushy semi-desert habitat of the camp.

Remarks. Our record is the first for Kabul province. The observation is correctly mentioned in Regan (2017; pp. 44–45, photos of the specimen are from Saudi Arabia but low quality photos are available also from Kabul, see Suppl. material 1).

Viperidae

Echis carinatus (Schneider, 1801)

Distribution in Afghanistan. This species has been recorded from various parts of Afghanistan (provinces Balkh, Farah, Helmand, Herat, Kandahar, Nangarhar, Nimroz; Wagner et al. 2016). These authors also mentioned a record at "*Sistan [Faizabad Prov.] (ZMUC R-6838)*", p. 516. This record is probably incorrect as there is no Faizabad Prov. in Afghanistan and the city Faizabad (Fayzabad) is in Badakhshan Prov. (eastern Afghanistan). Moreover, the coordinates provided by authors in the Appendix 1 are the same as for locality "*Seistan [=Sistan area near Iran border]*", p. 556 (western Afghanistan). Thus, potential distribution in Badakhshan needs future clarification.

Our records. Kandahar, Air Base, Kandahar (27 March 2009), adult, subadult and juvenile individuals of both sexes (Fig. 9G, H) in the desert habitat with bushes near the runway.

Remarks. This species is known from Kandahar city and its vicinity and our record corresponds with previous records presented by Wagner et al (2016). Therefore, we did not map this record.

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Supplementary material 1

The list of records and photographs from Afghanistan and their voucher numbers associated with the Herpetology collection of the Florida Museum of Natural History at the University of Florida (FLMNH UF 189172-232)

Authors: Daniel Jablonski, John M. Regan, Chace Holzheuser, Javeed Farooqi, Abdul Basit, Rafaqat Masroor

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